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EXAMINER

SHOSHO, CALLIE E

ART UNIT PAPER NUMBER

1714

6

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicant(s)

Application No.

Examiner

Callie E. Shosho

HIDAKA ET AL.

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 November 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 11/7/02.

In light of the new grounds of rejection as set forth with respect to Ma et al. (U.S. 6,117,921) in paragraph 5 below the following action is non-final.

**Claim Rejections - 35 USC § 112**

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites that the "acrylic polymer side chain has molecular weight of 300-20,000". The scope of the claim is confusing because it is not clear if the molecular weight refers to weight average, number average, etc. Similar questions also arise in claim 14 which recites "molecular weight".

**Claim Rejections - 35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 10-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma et al. (U.S. 6,117,921).

Ma et al. disclose water-based ink jet ink comprising 1-50% colorant and graft copolymer having backbone portion and side chain portion wherein either the backbone portion or the side chain portion is hydrophobic and the other is hydrophilic. The ratio of hydrophobic portion to hydrophilic portion is 90:10 to 10:90. The hydrophobic portion is obtained from monomers which include alkyl acrylates and methacrylates as well as up to 20% hydrophilic monomer such as (meth)acrylic acid and up to 30% monomer such as N,N-dimethylaminoethylacrylate, i.e. salt-forming monomers. The hydrophilic portion is obtained from 2-100% ionizable monomer such as (meth)acrylic acid and N,N-dimethylaminoethylacrylate, i.e. salt-forming monomers, as well as comonomers including C<sub>1</sub>-C<sub>12</sub> alkyl (meth)acrylates and nonionic hydrophilic monomer of the formula CH<sub>2</sub>=(C(R<sub>3</sub>)C(O)O(CH<sub>2</sub>CH<sub>2</sub>))<sub>m</sub>-R<sub>4</sub> wherein R<sub>3</sub> is H or CH<sub>3</sub>, R<sub>4</sub> is H or C<sub>1</sub>-C<sub>4</sub> alkyl, and m is 1-100. The molecular weight of the graft copolymer is 1,000-100,000 while the molecular weight of the macromonomer, and thus, the side chain is 1000-50,000. The alkyl methacrylates disclosed by Ma et al. would clearly encompass the lauryl methacrylate and isobutyl methacrylate presently claimed. The graft copolymer includes 2-phenoxyethylacrylate-co-methyl methacrylate-g-ethoxytriethyleneglycol methacrylate-co-methacrylic acid (col.2, lines 25-39,

col.3, lines 18-20, col.4, lines 31-33 and 39-45, col.5, lines 10-61, col.6, lines 10-16, 20-30, and 38-53, and col.7, lines 5-9 and 13-16). Attention is also drawn to col.23, line 54-col.24, line 50 which discloses butyl acrylate-co-methyl acrylate-g- ethoxytriethyleneglycol methacrylate-co-methacrylic acid which also falls within the scope of the present claims.

In light of the above, it is clear that Ma et al. anticipate the present claims.

6. Claims 1-4, 10-11, 13, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Anton et al. (U.S. 6,005,023).

The disclosure is adequately set forth in paragraph 5 of the office action mailed 5/10/02, Paper No. 4, and is incorporated here by reference.

With respect to newly added claims 10-11, 13, and 16-18, it is noted that Anton et al. disclose that the ink comprises 0.01-20% colorant while the graft copolymer comprises 10-50% side chain. The graft copolymer possesses weight average molecular weight of 5,000-100,000 while the side chain possesses weight average molecular weight of 1,000-30,000. The macromonomer possesses weight average molecular weight of 2,000-5,000 (col.3, lines 8-11 and 34-45 and col.4, lines 46-49). Although there is no explicit disclosure of the number average molecular weight of the macromonomer as presently claimed, given that ratio of weight average molecular weight to number average molecular weight is always greater than or equal to 1, it is clear that the macromonomer will possess number average molecular weight of at least 2,000-5,000 which overlaps the value presently claimed.

**Claim Rejections - 35 USC § 103**

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of Tone et al. (U.S. 5,336,725).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 5 and 6 above are incorporated here by reference.

The difference between Ma et al. or Anton et al. and the present claimed invention is the requirement in the claims of specific process used to prepare graft copolymer.

Tone et al., which is drawn to method for preparing graft copolymer, disclose making graft copolymer by reacting polymeric compound having one or more acrylic ester units in its molecular chain with metalizing agent followed by silanizing agent in order to produce a polymeric initiator which then initiates the polymerization of monomers such as (meth)acrylic esters to form side chain of graft copolymer wherein the polymeric portion of the polymeric initiator becomes the backbone of the graft copolymer (col.2, lines 8-15, 40-45 and 48-56, col.3, lines 32-45, and example 1).

The motivation for using such method is to produce graft copolymer with regulated molecular structure that has excellent transparency, weather resistance, and physical properties (col.1, lines 7-9 and col.10, line 58-col.11, line 15).

In light of the motivation for using specific graft copolymerization method disclosed by Tone et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such method to produce the graft copolymer in either Ma et al. or Anton et al. in order to produce graft copolymer with regulated molecular structure that has excellent transparency, weather resistance, and physical properties, and thereby arrive at the claimed invention.

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of either Nguyen et al. (U.S. 6,057,384) or Razavi et al. (U.S. 5,629,365).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 5 and 6 above are incorporated here by reference.

The difference between Ma et al. or Anton et al. and the present claimed invention is the requirement in the claims that the graft copolymer has specific functional group.

Nguyen et al., which is drawn to ink jet ink, disclose incorporating monomers which function as UV absorbers into the polymer present in the ink in order to impart lightfastness to the polymer, and thus, the ink (col.8, lines 1-3 and col.14, line 52-col.15, line 44).

Alternatively, Razavi, which is drawn to UV absorbing polymer latex suitable for use in inks, discloses incorporating UV absorbing monomer into the polymer in order to produce colorfast ink. It is noted that Razavi also disclose using the UV absorbing polymer latex in addition to acrylate polymers typically found in inks (col.2, lines 48-55 and col.7, line 59-col.8, line 5).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use graft copolymer which incorporates UV absorbing monomer into its structure in either Ma et al. or Anton et al. in order to produce ink composition which has good lightfastness or colorfastness, and thereby arrive at the claimed invention.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of Yui et al. (U.S. 5,977,207).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 5 and 6 above are incorporated here by reference.

The difference between Ma et al. or Anton et al. and the present claimed invention is the requirement in the claim of UV absorber and antioxidant.

Yui et al., which is drawn to ink jet ink, disclose the use of additives such as antioxidant and UV absorbing agent in the ink composition (col.6, lines 51-52). It would have been within the skill level of one of ordinary skill in the art to include these additives in order to prevent oxidation of the ink as well as impart lightfastness to the ink.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use antioxidant and UV absorbing agent in the ink of either Ma et al. or Anton et al., and thereby arrive at the claimed invention.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921).



The disclosure with respect to Ma et al. in paragraph 5 above is incorporated here by reference.

The difference between Ma et al. and the present claimed invention is the requirement in the claim of amount of nonionic polymer side chain.

Ma et al. disclose using nonionic monomers when making the graft copolymer in order to adjust the hydrophobicity/hydrophilicity balance and solubility properties of the graft copolymer (col.6, lines 20-27).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to choose amounts of nonionic polymer present in the graft copolymer, including amounts presently claimed, in order to produce polymer with desired solubility, and thereby arrive at the claimed invention.

12. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 5 and 6 above are incorporated here by reference.

The difference between Ma et al. or Anton et al. and the present claimed invention is the requirement in the claim of specific process used to prepare graft copolymer.

There is no disclosure in Ma et al. or Anton et al. of process to make graft copolymer as set forth in present claims 19 and 20.

However, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The

patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process”, *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) . Further, “although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product”, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983).

Therefore, absent evidence of criticality regarding process used to make the graft copolymer and given that either Ma et al. or Anton et al. disclose graft copolymer identical to that presently claimed, it is clear that Ma et al. or Anton et al. meet the limitations of the present claims.

13. Claims 1, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. (U.S. 5,589,522) in view of Ma et al. (U.S. 6,117,921).

The disclosure is adequately set forth in paragraph 11 of the office action mailed 5/10/02, Paper No. 4, and is incorporated here by reference.

14. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. in view of Ma et al. as applied to claims 1, 4, and 7 above, and further in view of either Nguyen et al. (U.S. 6,057,384) or Razavi (U.S. 5,629,365).

The disclosure is adequately set forth in paragraph 12 of the office action mailed 5/10/02, Paper No. 4, and is incorporated here by reference.

**Response to Arguments**

15. Applicants' arguments filed 11/7/02 have been fully considered but they are not persuasive.

Specifically, applicants argue that:

(a) Ma et al. disclose graft copolymer wherein the hydrophobic portion is aromatic which is in contrast to the present claims.

(b) Anton et al. disclose graft copolymer which has polymeric backbone which is hydrophobic and side chain that is hydrophilic which is in direct contrast to the present claims which require hydrophobic side chain.

With respect to argument (a), applicants argue that Ma et al. is not a relevant reference against the present claims given that Ma et al. disclose graft copolymer wherein the hydrophobic portion is aromatic while the hydrophobic portion of the graft copolymer of the present claims is not aromatic.

It is agreed that Ma et al. disclose that the hydrophobic portion of the graft copolymer must contain aromatic group.

However, it is noted that the present claims only require that the side chain comprises a "polymer made from at least one monomer represented by the formula  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$ ". Thus, the present claims are open to the polymers made from the claimed monomers in addition to other monomers. There is nothing in the present claims which excludes the use of a polymer made from other monomers in addition to the monomer presently claimed. The present claims only require that one of the monomers which is used to make the polymer is of the type presently

claimed. There is no restriction on other monomers used to make the polymer. That is, while the present claims require the polymer to be obtained from at least one monomer represented by the formula  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$ , it does not limit the polymer from being obtained from other additional monomers. As long as one of the monomers used to make the polymer is  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$ , the polymer would meet the requirements of the present claims.

Thus, although Ma et al. requires the use of aromatic monomer when forming hydrophobic portion of the graft copolymer, given that Ma et al. also disclose that the hydrophobic portion is also formed from monomers identical to that presently claimed, i.e.  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$ , it is the examiner's position that Ma et al. meets the requirements of the present claims.

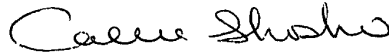
With respect to argument (b), it is noted that there is no requirement in the present claims that the side chain is hydrophobic. The present claims only require that the polymer is made from at least one monomer represented by  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$ . There is no limitation on the other monomers present in the acrylic side chain. That is, a polymer which is made from  $\text{CH}_2=\text{C}(\text{R}^1)\text{COOR}^2$  as well as other monomer such as, for instance, acrylic acid, would encompass the scope of the present claims. Depending on the type and amounts of monomers present, the acrylic side could be either hydrophobic or hydrophilic.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Callie E. Shosho  
Examiner  
Art Unit 1714

CS  
January 22, 2003